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Abstract

Stagflation and Shortageflation:
A Comparative Approach

This paper compares the sources of inflation and unemployment in western market economies with the sources of repressed inflation and persistent shortages common in centrally planned economies. Stagflation and shortageflation have much in common, and a similar theoretical structure is offered. Measures of stagflation for the OECD countries and a first approximation of a measure of shortageflation for the eastern European socialist countries reveal that Italy and Poland have the most severe, and West Germany and East Germany have the lowest rates. Furthermore, where relative prices fail to reflect relative scarcities, then queuing, gluts, and other allocative inefficiencies arise that can slow growth.

Stagflation and Shortageflation: A Comparative Approach

Contemporary inflation is a worldwide phenomenon in the sense that it occurs, but in different forms, in western market economies and socialist countries alike. The worldwide character of modern inflation is also revealed in its international transmission, which does underlie to some extent the primary focus on the comparisons that follow.[1] The literature dealing with inflation under socialism is very meagre, and partly as a result of this, there is also very little that compares the broader forms inflation takes under both systems. However there are interesting new insights such a comparison can offer.

This paper gives special attention to the basic difference between the inflation in highly developed largely capitalistic market economies, generally those of the western nations, and in centrally planned economies such as those of the eastern European socialist countries. In the case of the market economies, inflation is open in the sense that prices generally rise until they settle at a new equilibrium level. On the other hand, in the socialist countries the inflation is virtually always partly repressed.[2] In an economy of the latter type there is not an efficient mechanism balancing the quantities demanded with the quantities supplied. As a consequence the usual administrative central control of prices of many commodities frequently amounts to periodic price jumps for some commodities and a repression of the price rise which is indispensable for reaching a price equilibrium for the others. There remains an overall unrealized effective demand and shortages of many commodities therefore which we will refer to as "shortageflation."

In the sections that follow, after developing a comparison of the well known stagflation phenomenon in the West to shortageflation, which is its near mirror image in the socialist countries, and after considering the similar pressures that give rise to each, the paper will then turn to some of the implications for economic efficiency. These include effects on the efficiency of resource allocation, on incentives, on labor productivity, on growth, on unemployment, and on the character of the disequilibria in the markets. Since comparing inflation rates, or unemployment rates, alone is relatively meaningless, the next section will then seek to find a common denominator that can be used for intersystem comparisons. Finally we will return to the short run trade-offs--inflation versus unemployment (in the West), and inflation versus shortages (in the centrally planned economies).

Partly since the literature dealing with inflation under socialism is so meagre, (see Wilczynski (1977), for example), we feel that this new perspective offers some interesting new insights into the role of market incentives and into the impediments to allocative efficiency in both kinds of economic systems.

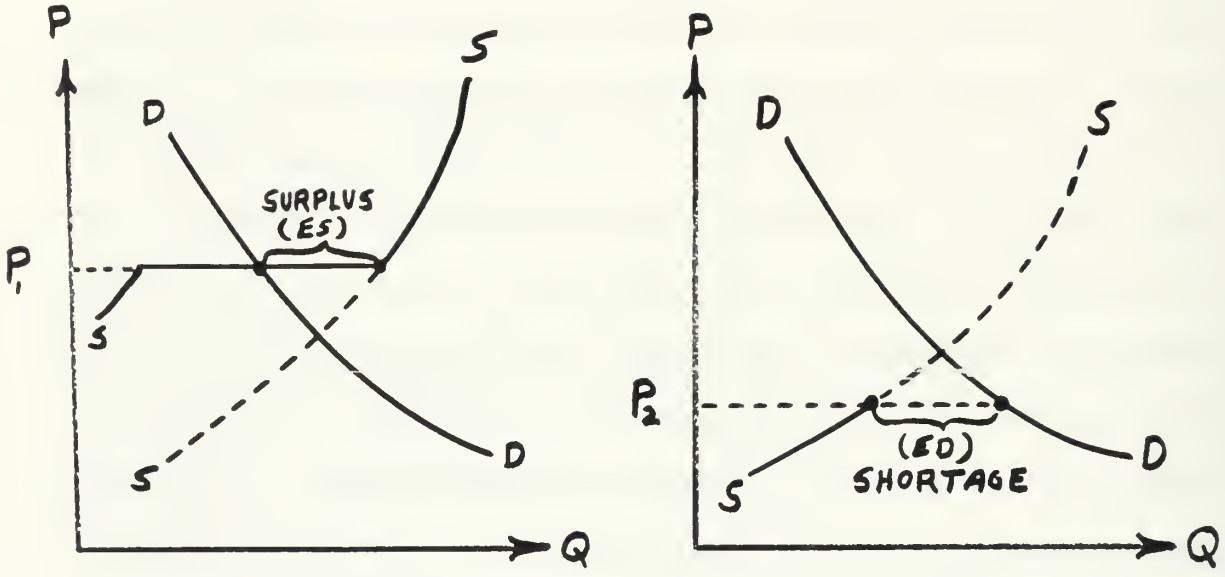
I. Price Disequilibrium

A fundamental feature on which we propose to focus is that prices are not perfectly flexible either in western economies, where some are subsidized or partly inflexible for other reasons--at least in the short run, or in the socialist economies where they are centrally planned and adjusted only infrequently. Markets therefore are not in price equilibrium in the short run in either economy. There are excess

supplies, or surpluses in some, and excess demands accompanied by shortages in others that persist.

Both the stagflation of western economies and their surpluses, which sometimes lead to their characterization as economies of surplus, are partially related to these wage and price inflexibilities. In labor markets both money and real wage rates for many types of employment are reasonably inflexible downward as demand declines, or at least their adjustment lags as part of the dynamic cyclical adjustment process, resulting in unemployment at existing wage and salary rates. Whether this is due to errors and misperceptions in planning, as the new classical economists would have it, or to minimum wage laws, multiple year labor contracts, instinctive resistence to being made worse off, or other sources of short run inflexibilities, as other economists would conclude, labor market surpluses nevertheless appear. Similarly agricultural prices are held above their equilibrium level, in this case by government agricultural price supports in the United States, France, Germany, Britain, and many other western countries. Surpluses of wheat, cheese, tobacco, corn, and other supported commodities appear and fill up the warehouses. In markets for manufactured goods, where suppliers have a degree of monopoly power, such as in electric and gas utilities in the U.S., in some durables, and certainly in markets dominated by international cartels, prices are usually held somewhat above a purely competitive equilibrium. Inventories persist, and if the sellers are not able to limit entry, excess supplies and surpluses are even more evident.

This situation is shown in Figure 1A, which is typical of a number of major factor or product markets. The price is somewhat above the



A. Western Market Economies; Selected Major Markets

B. Centrally Planned Economies; Other Major Markets

Figure 1. Surpluses and Shortages in Commodity and Factor Flows

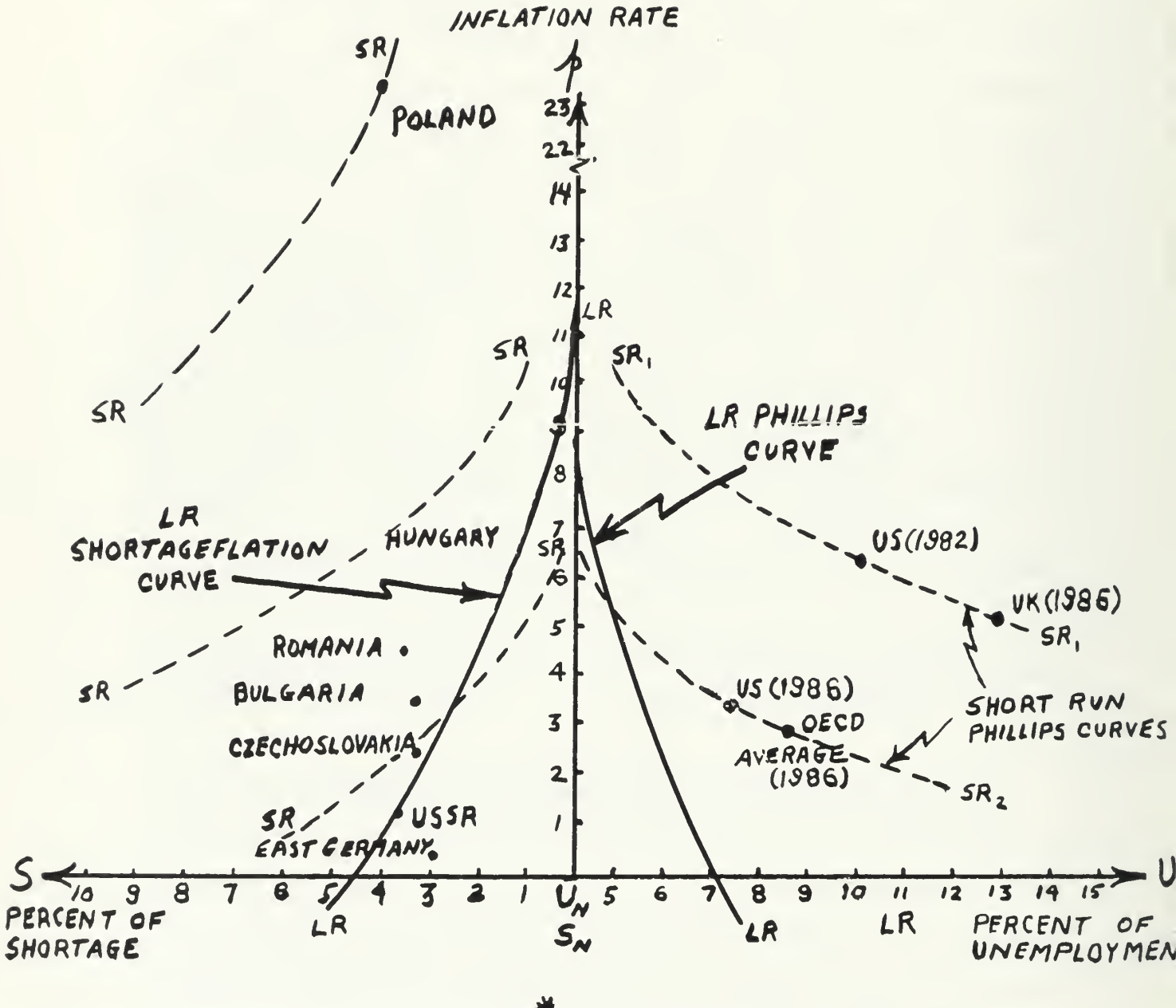
equilibrium level much of the time, and in these markets, larger inventories persist and surpluses appear.

In contrast, the situation more typical of centrally planned economies is shown in Figure 1B. There the governments such as those throughout eastern Europe and some LDCs set the prices centrally, and typically hold down prices, especially of food and other necessities.[3] The Soviet Union, for example, is proud of the fact that the price of food has not increased since 1957. In Poland, although there have been periodic jumps, there have also been long periods in between where the consumer prices have been held at stable and at lower levels than is consistent with the purchasing power available. The result is repressed inflation, unsatisfied excess demand, and persistent shortages of these commodities as illustrated in Figure 1B. Since price is not performing its normal rationing function, there are long queues, goods are rationed by means of the high cost to the buyer of standing in line, and an economy of shortages emerges. This is a simple comparison, but one that is frequently overlooked.

II. The Theory of Stagflation and Shortageflation

Stagflation and shortageflation are illustrated in Figure 2. They are both dynamic concepts since the inflation rate, which is the percentage rate of increase in prices with respect to time, is measured on the vertical axis and related to either the level of unemployment (to the right) or to the size of the shortages (to the left).

When considering the degree of stagflation shown on the right, this can be analyzed by use of both the short run Phillips curves shown as shifting and the longer run Phillips curve that the shifting shorter run



A. Centrally Planned Economies* B. Western Market Economies

Figure 2. Stagflation and Shortageflation, 1986

*SOURCE: 1977-1985 AVERAGE, TABLE 2.

Phillips curves generate. The long run curve is of the type that is intended to be empirically relevant. All points on both SR and LR curves involve the coexistence of some positive amount of both inflation and unemployment, which is characteristic of stagflation. Stagflation is worse, of course, at some times than at others and in some countries than in other countries. Several points are plotted for the U.S., U.K., and other OECD countries to call attention to this.

Shortageflation, to the left, can also be analyzed into shifting short run and longer run relations. But now the central planning agency selects the inflation rate, which is done empirically of course by setting the level of all prices, not just for food and necessities, but also for luxuries, and then changing some or all of these prices periodically. Each inflation rate chosen at a given level of excess aggregate demand will be associated with a different degree of supply shortage. The given overall level of excess aggregate demand is usually due to major public investment, defense, and social service efforts that are not fully financed with turnover and income taxes. So severe repression of the inflation rate which means that price cannot perform its normal rationing function is associated with larger shortages and longer queues. Other things the same, the wider the deviation of prices from the equilibrium price the longer the queues. Conversely, the closer the price adjustments to the free market prices, and hence to an open inflation rate, the less severe the shortages. In this case the inflation rate is acting as a tax, albeit a somewhat cruel and capricious one.

Stagflation: Rising Prices Accompanied by Excess Capacity and Unemployment

Further attention will soon be devoted to these problems of macroeconomic stabilization in the socialist countries because they have been less well analyzed in the literature. But first some further remarks about the causes of inflation and unemployment in the western O.E.C.D. and third world market economies will facilitate the comparisons.

Short Run Phillips Curves. The short run modified Phillips Curves shown in Figure 2 reflect price inflation as a function of the size of the product gap in the products markets as well as the rate of wage inflation which in turn is dependent in a major way on the level of unemployment in the factor markets. Using Okun's law, which relates the size of the products gap to the size of the unemployment gap in the factor markets, the product and factor gap terms can be collapsed into one, as will be demonstrated below, and the product price inflation rate expressed as a function of merely the unemployment rate in the reduced form price equation. It is these "modified Phillips curves" that have been illustrated in Figure 2.

The shifts in the short run relationship illustrated in Figure 2 are an inherent part of the process, and of the modern theory of inflation. There are three major sources of these shifts within each country at different points in time, and therefore as between countries when comparing several countries at a single point in time. At any given level of aggregate demand (i.e., thinking for the moment of the shifts as directly vertical shifts), upward shifts have been caused by increases in raw material and crude oil prices, by expectations on the higher inflation rate (whatever the cause) gets built-in to wage

rate contracts empirically, raising the wage inflation rate and by slower productivity growth. These elements depending upon the level of employment, wage rate expectations, productivity, interest cost factors, and raw material price shocks are summarized as demand-pull, core, and shock inflation rate components. Not all are necessarily operating at any given time, and as between countries different combinations of these sources are present. In the U.S., for example, in 1986, there is little evidence of excess demand (with unemployment still relatively high) or of shock inflation (with oil prices falling and the prices of raw materials supplied by the third world lower). Almost all of the approximately 3 percent inflation rate that remains therefore is "core" inflation resulting from the lag in adjustments of labor contracts, cost-based reimbursement health care price increases, built-in social security and armed forces pension indexation, and the like. The United States therefore is shown on the lower short run Phillips curve, which has shifted downward from where it was earlier before aggregate demand was reduced by use of tight monetary policies. Raw material price shocks have slackened off, inflationary expectations have started to get worked out of the system, and after the earlier 1982 trough of 10.9 percent unemployment was reached, the recovery has started to help productivity to start rising again.

This familiar wage price interaction process is developed further, together with careful empirical estimates, by Bruno and Sachs (1985), Eckstein (1983, Ch. 13), Goodman and McMahon (1979) and is updated monthly in the chapter on "Prices, Wages, and Productivity" in the Data Resources Inc. Review of the U.S. Economy. International applications

of this modified Phillips Curve for the OECD countries are tested by Paldam (1980).

Productivity Growth. To get more specific about the role of productivity growth, which is particularly interesting where international comparisons are involved, as well as about the relation of these shifting short run Phillips curves to an empirically relevant longer run relation such as that shown in Figure 2, it is necessary to set out the underlying wage and price equations, and to derive the reduced form price equation which reveals the sources of the shifts and their longer run effects.

Equation (1) below shows the price equation, equation (2) is the wage equation, (3) is Okun's law, (4) lets expectations get fully built-in, and (5) is the modified Phillips equation, obtained as a reduced form solution for this wage-price-employment sector by combining (1)-(4):

$$(1) \qquad p = \beta_1\left(\frac{Y_P - Y}{Y_P}\right) + \beta_2 w + \beta_3(y-n) + \beta_4 p_E, \qquad \begin{cases} \beta_1, \beta_3 < 0 \\ \beta_2, \beta_4 > 0 \end{cases}$$

$$(2) \qquad w = \alpha_1(U-U_N) + \alpha_2\pi + \alpha_3(y-n), \qquad \begin{cases} \alpha_1 < 0 \\ \alpha_2, \alpha_3 > 0 \end{cases}$$

$$(3) \qquad (Y_P - Y)/Y_P = \gamma_0(U-U_N), \qquad \gamma_0 > 0$$

$$(4) \qquad \pi = \alpha_0 p, \qquad \alpha_0 = 1$$

$$(5) \qquad p = \frac{\beta_1\gamma_0 + \beta_2\alpha_1}{1 - \beta_2\alpha_2}(U-U_N) + \frac{\beta_3 + \beta_2\alpha_3}{1 - \beta_2\alpha_2}(y-n) + \frac{\beta_4}{1 - \beta_2\alpha_2}(p_E)$$

where:

p = the price inflation rate and w = the wage inflation rate,

Y = real GDP, and Y_P = potential real GDP, so that $(Y_P-Y)/Y_P$ = the products market gap,

$(y-n)$ = labor productivity growth, measured here as the percent change in real GDP(y) less the percent change in employment (n),

p_E = the percent change in energy and raw material prices,

U = unemployment and U_N = the natural rate estimated at 4.5% in Figure 2, and

π = the expected inflation rate. All other terms are parameters.

Equation (5) summarizes demand pull, core, and shock sources of inflation in western market economies. Using econometric estimates of the parameters, the equations can be used to plot the shifting short run Phillips curves in Figure 2 (if equation (4) is omitted), and they generate the long run Phillips curves if equation (4) is used. Since β_2 is known to be close to one, and α_2 to be significantly less than one by most econometric estimates at least for the U.S., Germany, Japan, and Denmark (see Paldam (1980), McMahon (1986), and Eckstein and Girola (1978), for example), the longer run empirically relevant Phillips curve is not vertical, but is steeper than the short run Phillips curves as shown in Figure 2. Furthermore, since the absolute value of the negative parameter β_3 is larger than the absolute value of $\beta_2\alpha_3$ in empirical estimates, faster productivity growth will help to shift the short (and long run) Phillips curves downward. α_3 measures the extent to which productivity increases get built-in to wages and salaries, and β_3 the extent to which the benefit of productivity increases tends to

be passed forward to final consumers through lower product prices. There are differences among countries in this regard which may help to explain why the shorter run Phillips curves are higher for some countries such as the U.K., Belgium, and the Netherlands even though they may be at the same stage in their business cycle movements.

There is an inverse relationship to that described above for each of the sources of shortageflation in the socialist countries. But before turning to that, further description of the nature of this phenomenon in the centrally planned economies should be of interest and will help to set the stage.

III. Shortageflation: Partially Repressed Inflation with Shortages

The fundamental feature of an inflation under socialism is its dual character (see Kolodko (1984) and (1986)). On one hand the inflation is revealed in the "classic" way, i.e., through a rise in the price level, and on the other hand through additional unsatisfied excess demand which reveals itself in market shortages and hence in continuing market disequilibrium. The more or less permanent existence of this excess demand is a direct result of the persistent tendency toward repression of the inflationary price increases. The consequence for the economy is chronic shortage which then leads to inefficient resource allocation and other problems.

Reasons for Repression of Inflation

The first reason for repression of inflation is linked to the long-time conviction that a repression of price increases will facilitate investment projects and thereby aid economic growth. The maintenance of relatively lower prices reduces however the response to

growing consumption demand. As a consequence the household sector is forced to save part of its money income. From a macroeconomic point of view it means that consumption is lower to the extent of the involuntary savings. So forced savings come into being as the result of the repression of the inflationary price growth. This forced saving does release some resources to produce investment goods since these are full employment economies. But the liquid assets also constitute an inflationary overhang.[4] A second closely related reason for the repression of inflation issues from the conviction that a relatively stable price level favors the increase of labor productivity. With less inflation, money wage increases are also real wage increases, and this change in the distribution of income toward labor is thought to increase labor effort.

The third reason is the conviction that lower prices of food and necessities redistribute real income to lower income groups. This reason is not based on the relation of wages to productivity, but instead stresses equity and equality for lower income groups.

These reasons can only be justified if the repressed inflation is temporary and the shortages are limited. The reality, however, is that repressed inflation and the attendant shortages are chronic phenomena in many socialist economies. The economic system demonstrates a permanent tendency toward excess demand and, consequently, toward supply shortages.

The Effects from Repression of Inflation

This results in all sorts of problems that reduce the effectiveness of the investment and reduce labor productivity which turn

finally against economic growth. Under the circumstances of repressed inflation prices do not reflect relative scarcities. In most cases they are not set on the basis of the relation between supply and demand but on a cost-based reimbursement basis or cost-plus pricing. On this basis the price structure is distorted away from one which reflects the resource costs of production and relative demands for their alternate uses, and therefore the price signals are false. In such a situation the allocation of factors--both of capital and labor--is far away from an optimal allocation. Eventually this leads to reduced economic efficiency.

The repression of the inflation also affects labor productivity negatively. The shortage is accompanied by a set of negative phenomena in the relation between the market and households, for example. The waste of time standing in long lines, forced substitution of products, involuntary savings, administrative rationing of goods in short supply, and bribery unequivocally affect household satisfaction and labor productivity in a negative way.

Therefore, what are the real reasons for repressing inflation in the centrally planned economies, since the intended results do not seem to respond to reality? We can indicate two essential reasons: one is economic and the other political. The key economic reason is linked to a basic feature of a socialist economy. It is an unlimited investment demand, which then leads to excess aggregate demand. Janos Kornai (1980, pp. 478-9) has observed that:

> The volume of investment does not depend on the financial state of the firms' sector, its present and future profits, accumulated or additional savings, the condition of the state budget, or (the constraint of) expected sales. It would be a

> mistake to omit these factors from a growth model of a capitalist economy--just as it would be a mistake to include them in the present model (of a socialist economy).

As a consequence the expansion drive causes many bottlenecks, disequilibrium, and chronic shortages. As this affects the household sector, the purchasing power generated by investment results in excess demand, and the shortages of consumer goods follow as the direct result of the repression of the resulting inflation.

The causes of this continuing use of repressed inflation in the long term lie not in its political and economic popularity since no government relishes shortages and dissatisfied workers. But it lies in two more subtile political conditions.[5] The first comes from the conviction that government is better and more efficient if the rate of price growth is lower. The second is the long-term force of habit of a relatively stable price level, and the larger reactions that occur when the discrete price changes are made. This links to the price setting policy in centrally planned economies. There is a deep conviction that the price level does not depend on production costs and market relations, but on "good" or "ill" behavior by the State. This is not surprising since the basic responsibility for price formulation is concentrated at the central level, i.e., in the hands of State. Therefore a government is always under political pressure not to pass the price increases through. This repression of cost increase is impossible in a market economy, but it is done in centrally planned and directed economies. Since it can be done it is done.

These considerations lead to the conclusion that the existence of repressed inflation, excess demand, and shortages are possible in an economy even though monetary policy does not perform an active role.

In a centrally planned economy there is no monetary policy as it is known in the West. Instead the supply of money for the firms' sector is automatically adjusted to the uses for funds for transactions. That is, the firms' expenditures are constrained by the physical quantities of inputs supplied, not by the effective demand for output. The financial flows adjust to these real production processes--not the contrary. The financial resources for effective demand and the interest rates charged for funds are not a constraint, and the inputs and other commodities--on the other hand--are scarce.

The simple effect of the typical performance of these quantitative controls continues the dilemma of choosing between a higher rate of inflation and lower shortages--versus a lower rate of inflation and greater shortages. There are of course many constraints on this choice both of a political and of an economic nature, just as there are in western market economies choosing between inflation and unemployment.

The Effective Rate of Inflation in an Economy Where There Are Shortages

Is it justified to identify the shortage only with repressed inflation, or should the costs of the shortages also be counted and added to the (repressed) prices in some kind of a welfare index?

First in terms of quantities, there is the overall market requirement that aggregate excess demand is equal to the aggregate shortage of supply. Second, the repressed inflation followed by the shortage still has some of the same effects as an open inflation in general. Even in the presence of repressed inflation, the price level never is entirely stable. Some prices are changed upward periodically. Some change in the black market, or in the farmers' markets.

But to the extent that a shortage persists, the actual real prices of the goods in short supply are higher than their money prices because the situation is accompanied by the queuing costs born for purchase of particular goods that can be measured in lost job time (within which a real wage that can be added to the money price could have been earned) plus the value of lost leisure time which has been wasted during the search for desired consumer and producer goods. Third, the repressed inflation--even under a hypothetical situation of totally constant prices--is attended by a depreciation of the value of money and its capacity to purchase goods which is like a tax (in place of a higher original price), an effect that is also an inherent attribute of inflation. However, in this case the depreciation does not reveal itself in the purchase of a smaller quantity of goods for each unit of money but instead in the complete impossibility of spending part of one's disposable income.

Fourth, where there is an administrative repression of price increases there are redistribution effects. Finally, the repressed inflation is accompanied by an excess of money in circulation. This does not necessarily mean that the money supply has increased in the current period, but instead that unspent balances have been carried over from the past, and that the money supply has increased excessively at a previous time.

So, the repression of price increases does not eliminate these costs of inflation, including the periodic price increases that are not repressed, the time-costs of queuing, the redistribution of income and wealth, and depreciation of money in the sense that it cannot buy goods.

Conflicting Viewpoints

Janos Kornai (1980, p. 498) tries to discount the inflation-shortage trade-off, suggesting that:

> There is a causal relationship in one direction: the shortage strengthens the tendency towards price--drift. But there is no casual relationship in the opposite direction (...). A constant price level, a fall in price, and a rise in price are equally compatible with the permanent maintenance of the normal intensity of shortage. Norms of shortage are not eternal, but no price change, in either direction, can on its own alter them in the long run.

But are the price elasticities of demand and supply both zero, even in the long run? Does the fact that the shorgage is chronic mean that there is no possibility of choosing higher prices and lesser shortages? Under socialism any such rise in the price level implies a wage increase that supports further demand expansion. Since nominal income goes up faster than real output the long run Phillips curve as it relates to shortageflation (Fig. 2 and Eq. (5)) becomes almost completely vertical and the shortage persists.

IV. Stagflation and Shortageflation: Eventual Possibilities for More Comprehensive Empirical Analysis

One interesting kind of comparison can be made by comparing the familiar "unhappiness index" for western market economies, which is merely the sum of the inflation rate and the unemployment rate, with an analogous index consisting of the sum of the overall rate of shortages and the open inflation rate in each socialist economy.

For western market economies, the inflation rate, the unemployment rate, and the combined unhappiness index, or stagflation rate, is shown in Table 1. The countries are ranked by the size of their inflation rate in 1984 as shown in the first column, whereas the rank of

Table 1

Inflation, Unemployment and Stagflation Rates
in Western Market Economies
1984 and 1980-84 Average

	Inflation Rate[a]	Unemployment Rate	Stagflation Rate	Rank of Stagflation 1984	Rank of Stagflation 1980-84
Italy 1984	10.7	10.4	21.1	1	
1980-84	16.4	9.0	25.4		1
France 1984	7.4	10.0	17.4	4	
1980-84	11.2	8.2	19.4		2
Other Industrial Countries[b] 1984	6.5	11.4	17.9	2	
1980-84	8.9	9.2	18.1		4
Great Britain 1984	5.0	12.7	17.7	3	
1980-84	6.0	10.6	16.6		5
Canada 1984	4.4	11.3	15.7	5	
1980-84	8.7	9.9	18.6		3
U.S.A. 1984	4.3	7.5	11.8	6	
1980-84	7.5	8.3	15.8		6
West Germany 1984	2.4	8.1	10.5	7	
1980-84	4.5	6.3	10.8		7
Japan 1984	2.2	2.7	4.9	8	
1980-84	3.9	2.4	6.3		8

Source: World Economic Outlook International Monetary Fund, Washington, D.C., April 1985, pp. 209, 213.

[a]Consumer Price Index.

[b]Composites of the country groups are in the relevant percentages for each country weighted by the average dollar value of that country's GNP over the preceding three years.

their composite stagflation rate is shown in the two right hand columns for 1984 and 1980-84 respectively. By this measure, the highest stagflation rates are found for the 1980-84 period as a whole in Italy, France and Canada, whereas the lowest stagflation rates are found in the U.S., West Germany and Japan.

For the centrally planned economies, an analogous rate of shortage-flation can be computed. It is simply the sum of the rate of open inflation plus the rate of shortage. To conceptualize the rate of shortage that needs to be measured we refer to Figure 3. There the excess demand at the centrally set price level (P_1) is the distance ($Z-Y_P$). Expressed in percentage terms, this rate of shortage (r_{SH}) is:

$$(6) \qquad r_{SH} = \frac{Z - Y_P}{Y_P}$$

This shortageflation rate then is merely the sum of the actual inflation rate and the rate of shortage:

$$(7) \qquad r_{SF} = \frac{P_1 - P_0}{P_0} + \frac{Z - Y_P}{Y_P} = p + r_{SH}$$

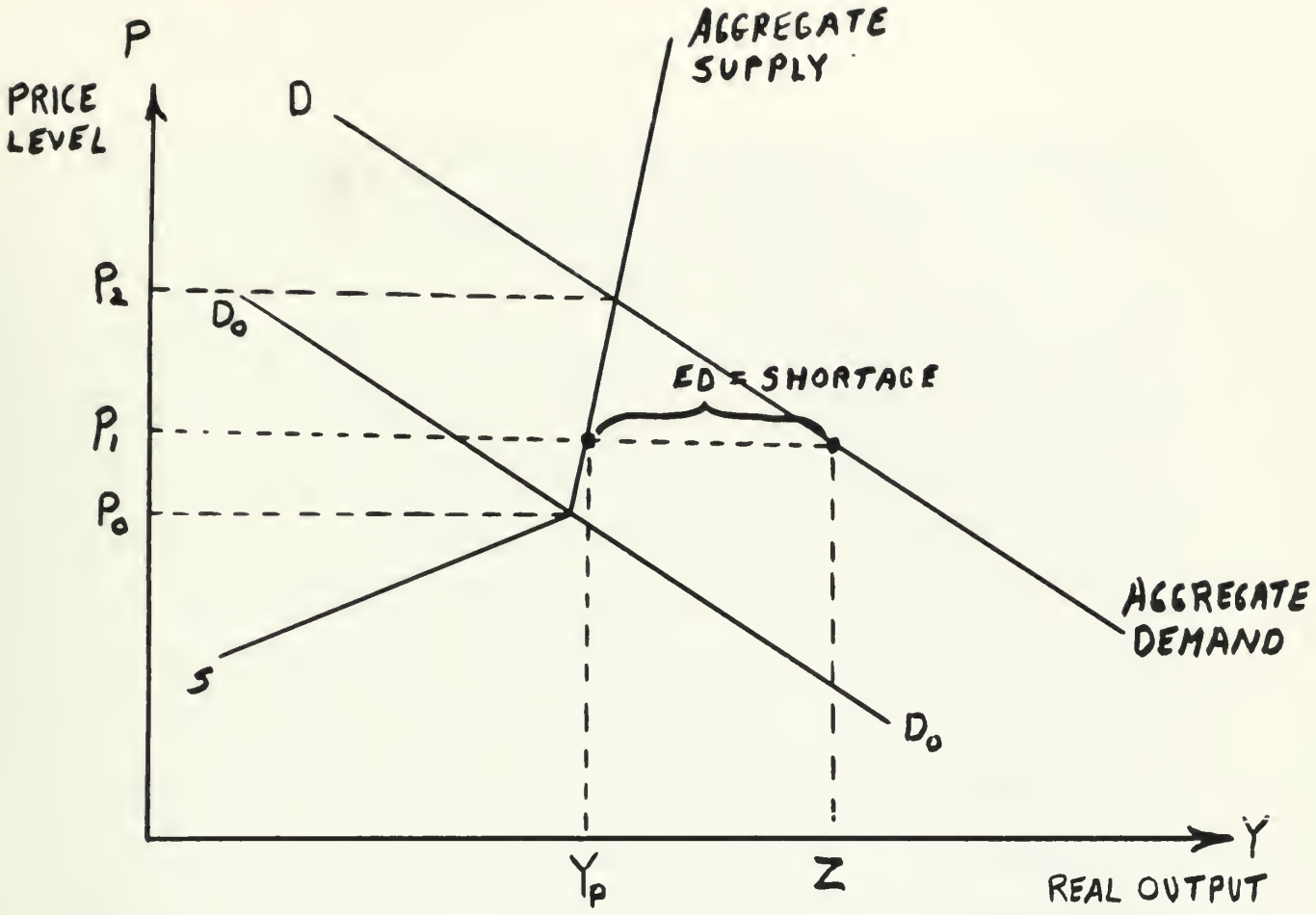
where r_{SH} = percent rate of shortage

r_{SF} = shortageflation rate

p = rate of open inflation, as in Figure 2.

The shortage (see Figure 3) is a function of the size of the excess demand (i.e., of distance $Z-Y_P$), or of the slope (which is related to the elasticity of demand) $\frac{\partial P}{\partial Y}$ times the extent to which the centrally set prices are held below their equilibrium levels ($P_2 - P_1$).

There are almost impossible difficulties in finding data either for the size of the shortages or alternatively for the elasticity of demand



$ED = (\partial P/\partial Y) \cdot (P_2 - P_1)$

P_0 = Last period's price level

P_1 = This period's actual price level (repressed inflation)

p = Inflation rate = $(P_1 - P_0)/P_0$

$(P_2 - P_1)$ = Extent to which centrally set prices repress inflation

$(Z - Y_p)$ = Quantitative extent of excess demand (shortages) at the new price level P_1

The shortage = a function of the size of the excess demand (i.e., of distance $Z - Y_p$), or of the elasticity of demand $(\partial P/\partial Y)\frac{-1_P}{Y}$ and of the size of the repression $(P_2 - P_1)$ of prices.

Figure 3: Repressed Inflation in Centrally Planned Economy

and the extent to which prices are repressed ($P_2 - P_1$) in the socialist countries under discussion. Only for Poland is such data reasonably available (see Kolodko (1985)). However, based on sample data for selected markets in the other socialist countries, it is possible to develop a first approximation of the size of the shortages in each. It is possible to estimate the severity of the shortages through--for example--the length of waiting time for an apartment (in Poland about 15 years), or for a car (about ten years in East Germany). Some impressionistic estimates can be made from our observations of the time spent waiting in shopping lines for food (especially meat in some countries under discussion) and for durables. It would be difficult, but not impossible, to collect more systematic data on these aspects. A weighted average of the shortages is equal to aggregated excess demand (i.e., ED at Figure 3).

Another approach is to deduct the sum of the desired savings and liquid asset balances from the total value of the population's liquid asset balances:

$$(9) \qquad ED = R_m - (S_v + T_r)$$

where ED = shortage

R_m = population's total liquid asset balances

S_v = voluntary savings

T_r = demand for money for transaction and precautionary purposes.

This does give a conceptual estimate of the inflationary overhang, but it is not free from methodological complications. They are the problems

involved in accurate estimation of which function of total assets constitutes voluntary savings and desired transaction balances. Estimates have to be based on assumptions about consumers' time-preference, households' management of liquid assets, the propensity to save, and the velocity of money. However, again for a first approximation, we assume that voluntary savings include those liquid assets placed in bank accounts in the form of special-purpose and long-term deposits plus about one-third of demand deposits. Voluntary savings should thus be understood as all deposits for some specific purpose, including retirement, or for the sake of prudence. With respect to desired transaction balances, this estimate is based on the average income earned in the three major groups of the population and the length of the pay periods. The latter is two weeks for wage earners and social-benefit recipients, and one and a half months for private farms and private businesses. Compulsory savings of the population in the form of excess bank deposits are then simply the difference between total demand deposits and that part desired for transactions purposes as indicated above. Based on these criteria, admittedly somewhat unsystematic observation, a first approximation estimate of the rate of shortage is offered for each of the seven east European socialist countries in Table 2. The shortages are largest for the 1977-84 period as a whole in Poland, Romania, and the Soviet Union and smallest in Hungary.

The Shortageflation Rate

The shortageflation rates for these socialist countries are shown in Table 3. They are merely the sum of the inflation rates and the shortage rates shown in Table 2.

Table 2

Rate of Inflation and Rate of Shortages
in Socialist Countries in 1977-84

Country		1977	1978	1979	1980	1981	1982	1983	1984	Average Rate
Bulgaria	Inflation:	1	1	5	14	0	1	3	1	3.2
	Shortages:	4	4	3	3	3	4	3	4	3.5
Czechoslovakia	Inflation:	2	2	4	2	1	4	1.	1	2.1
	Shortages:	3	3	3	3	3	3	3	3	3
East Germany	Inflation:	0	0	0	1	0	0	0	0	0.1
	Shortages:	3	3	3	3	3	3	3	3	3
Hungary	Inflation:	4	5	10	9	5	7	7	8	6.8
	Shortages:	2	2	2	2	2	2	2	2	2
Poland	Inflation:	6	8	7	9	21	101	20	15	23.4
	Shortages:	2	3	4	6	8	4	5	6	4.7
Romania	Inflation:	1	1	1	2	2	17	5	8	4.6
	Shortages:	4	4	4	4	4	2	3	4	3.6
Soviet Union	Inflation:	0	1	1	1	1	4	1	-1	1
	Shortages:	4	4	4	3	3	3	4	4	3.6

Source: Inflation: "Rocznik Statystyczny" ("Statistical Yearbook"), GUS, Warszawa, various issues.
Shortages: First approximations based on observations of the elements described in the text for the 7 socialist countries.

Table 3

Average Rate of Shortageflation in Socialist Countries in 1977-84

Country	Shortageflation Rate
Bulgaria	6.9
Czechoslovakia	5.1
East Germany	3.1
Hungary	8.9
Poland	28.1
Romania	8.3
Soviet Union	4.6

Source: Sum of elements in Table 2.

The most acute rates of shortageflation are in Poland, followed by Hungary, Romania, and Bulgaria. East Germany has had both a lower actual inflation rate and a relatively lower rate of shortages than most of the others. Hungary, however, has had considerably less acute shortages, although this has been accompanied by a higher rate of open inflation.

Comparing these shortageflation rates to the stagflation rates shown in Table 1 for the western market economies is interesting, if the appropriate qualifications are stressed. They are not directly comparable welfare indices. But the comparison is more legitimate than comparing open inflation rates alone, or unemployment rates alone, ignoring the effects of the shortages. In Table 1, Italy had the worst stagflation rate (25.4%), somewhat comparable to Poland's shortageflation in the East (28.1%). West Germany had the best stagflation rate (10.8%) most comparable to the relatively lower rates of shortageflation in East Germany, Czechoslovakia, the USSR, or Hungary.

CONCLUSIONS

Inflation in market economies does not reveal itself in the same way that it does in the centrally planned economies. We find that the comparison of the intensity of open inflation alone is relatively meaningless. What may be justified among countries with similar economic systems cannot be used without criticism for intersystem comparisons. There are somewhat analogous trade-offs within each system: inflation versus unemployment in the western market economies, and inflation versus shortages in the socialist economies. We have set out an equation

structure that could be applied to both, replacing only the unemployment term with a measure of the severity of the overall shortages.

In the centrally planned economies, supply shortages lead to forced savings, some of which are not invested. This can result in relatively slower growth of output not only for that reason, but also because of the allocative inefficiency involved. In the market economies supply shortages are infrequent, but there are instead surpluses of goods and other stimuli to consumption. In part, one result of this is not forced savings, but instead too little savings. This then in turn, also results in slower growth.

In the centrally planned economies as prices are held down, this contributes to shortages and allocative inefficiency. But lest one be too hasty, that is not all that is different from the market economies where there are price supports, and other sources of rigidities of prices above equilibrium levels, followed by surpluses, and again allocative inefficiencies.

A case can be made of course for replacing the price system when there is market failure. Market failure can occur when there is monopoly, or very poor levels of information, or when there are externalities. In the case of externalities, since the price system does not work, there normally must be subsidies to get a sufficient quantity of the public good in question produced. A case also can be made (preferably by other means) for making some corrections to the income distribution both within western market economies and within socialist economies alike. But when the price system is not allowed to reflect relative resource scarcities, or to signal bottlenecks and relative

intensity of demands, there is a price to be paid as the result of allocative inefficiency, forced saving, and slower growth.

Footnotes

[1]For a survey of the literature and of the theory concerning this subject of worldwide inflation see Choi (1985). See also Krause and Salant (1977), Lindberg and Maier (1984), and Bruno and Sachs (1985).

[2]Repressed inflation has not been common in the western economies except in extreme cases such as in World War II and the years immediately following the war. On repressed inflation under capitalism see Hicks (1947), Paish (1953), and Charlesworth (1955).

[3]On inflation in the LDC's see Cline (1981).

[4]We refer to an inflationary overhang as the stock of unspendable disposable income in the household sector caused by the repressed inflation and shortages. See Kolodko (1985).

[5]The inflation also reflects various political aspects, so the complete explanation of this complicated process on a purely economic basis is simply impossible. See, for instance, Hankel and Issak (1983).

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